Listing of Claims:

1. (Previously presented) A method, comprising:

receiving a filter parameter at a satellite in orbit;

receiving an input signal at the satellite;

programming a filter in the satellite to separate a plurality of sub-signals from the input signal based on the filter parameter;

filtering the input signal into the plurality of sub-signals as programmed based on the filter parameter

translating the plurality of sub-signals into an output signal, wherein translating the plurality of sub-signals comprises:

multiplying the first sub-signal by a first number to produce a first amplified signal;

multiplying the second sub-signal by a second number to produce a second amplified signal, the second number being different from the first number; and

adding the first amplified signal and the second amplified signal; and transmitting the output signal from the satellite; wherein:

the input signal comprises an uplink from a plurality of earth stations to the satellite, the plurality of earth stations comprising a gateway and a user station;

the output signal comprises a downlink from the satellite to the plurality of earth stations;

and

the plurality of sub-signals comprise a first sub-signal and a second sub-signal, wherein the first sub-signal comprises a forward link from the gateway to the user station, and the second sub-signal comprises a return link from the user station to the gateway.

2. (Original) The method of claim 1, wherein the filter parameter comprises at least one of a high frequency limit for the input signal; a low frequency limit

for the input signal, a median frequency to separate a first sub-signal from a second sub-signal within the plurality of sub- signals, and a set of frequency boundaries for each of the plurality of sub-signals.

3-4. (Cancelled)

5. (Previously Presented) The method of claim 1, further comprising:
applying different gain amounts to selected ones of the plurality of sub-signals.

6. (Cancelled)

7. (Previously Presented) The method of claim 1, wherein filtering the input signal comprises:

sampling the input signal at a sample rate to produce a sample stream;

quantizing each sample of the sample stream into a particular number of bits; and processing the sample stream into the plurality of sub-signals.

8. (Previously presented) The method of claim 1, wherein the input signal further comprises uplinks from a plurality of beams servicing the plurality of earth stations and the output signal comprises downlinks to the plurality of beams, and wherein translating the plurality of sub- signals into the output signal comprises:

switching the plurality of sub-signals from particular uplinks to particular downlinks.

9. (Original) The method of claim 8, wherein switching the plurality of sub-signals comprises assigning at least one of the plurality of sub-signals received from an uplink corresponding to a particular beam to a downlink corresponding to a different beam.

10. (Previously presented) The method of claim 1, further comprising:

receiving an original signal at the satellite, the original signal having a first center frequency and a first bandwidth; and

down-converting the original signal to the input signal, the input signal having a second center frequency equal to one-half of the bandwidth plus a frequency margin, and the input signal having the first bandwidth.

11. (Previously presented) The method of claim 1, further comprising:

receiving a first signal at the satellite, the first signal having a bandwidth;

down-converting the first signal to a first intermediate frequency (IF);

filtering the down-converted first signal so as to produce a plurality of N intermediate signals, each of the intermediate signals having 1/N of the bandwidth; and

down-converting each of the intermediate signals to a plurality of component signals,

the plurality of component signals including the input signal, each of the component signals having a high frequency equal to1/N of the bandwidth plus a frequency margin, and each of the component signals having 1/N of the bandwidth.

12. (Previously presented) An apparatus, comprising:

a satellite configured to receive a filter parameter, wherein the filter parameter comprises at least one of a high frequency limit for the input signal, a low frequency limit for the input signal, a median frequency to separate a first sub-signal from a second sub-signal within

the plurality of sub-signals;

the satellite further comprising:

a programmable filter configured to separate a plurality of sub-signals from an input signal based on the filter parameter; and

a frequency translator configured to translate the plurality of sub-

signals into an output signal, wherein the frequency translator comprises:

a first digital multiplier configured to multiply the first sub-signal by a first number to produce a first amplified signal;

a second digital multiplier configured to multiply the second sub-signal by a second number to produce a second amplified signal, the second number being different from the first number; and

a digital adder configured to add the first amplified signal and the second amplified signal; and

a transmitter configured to transmit the output signal from the satellite; wherein

the input signal comprises an uplink from a plurality of earth stations to the satellite,

the plurality of earth stations comprising a gateway and a user station;

the output signal comprises a downlink from the satellite to the plurality of earth stations;

and

the plurality of sub-signals comprise a first sub-signal and a second sub-signal, wherein the first sub-signal comprises a forward link from the gateway to the user station, and the second sub-signal comprises a return link from the user station to the gateway.

13-15. (Cancelled)

16. (Previously presented) The apparatus of claim 12, wherein the frequency translator further comprises:

a programmable amplifier configured to apply different gain amounts to selected ones of the plurality of sub-signals.

17. (Cancelled)

18. (Previously presented) The apparatus of claim 12, wherein the programmable filter further comprises:

a sampler configured to sample the input signal at a sample rate to produce a stream of samples each having a particular number of bits; and

a processor configured to process each sample into the plurality of sub-signals.

19. (Previously presented) The apparatus of claim 12, wherein the input signal further comprises uplinks from a plurality of beams servicing the plurality of earth stations and the output signal further comprises downlinks to the plurality of beams, and wherein the frequency translator comprises:

a switch matrix configured to switch the plurality of sub-signals from particular uplinks to particular downlinks.

20. (Previously presented) The-apparatus of claim 19,wherein the switch matrix is further configured to assign at least one of the plurality of sub-signals received from an uplink corresponding to a particular beam to a downlink corresponding to a different beam.

21. (Previously presented) The apparatus of claim 12, further comprising:

a down-converter configured to receive an original signal at the satellite, the original signal having a first center frequency and a bandwidth, the down-converter adapted to

down-convert the original signal to the input signal, the input signal having a second center frequency equal to one-half of the bandwidth plus a frequency margin, and the input signal having the bandwidth.

22. (Previously presented) The apparatus of claim 21, further comprising:

an analog filter configured to receive an original signal at the satellite, the original signal having a bandwidth, the analog filter to filter the original signal into a plurality of N intermediate signals, each of the intermediate signals having 1/N of the bandwidth; and

a down-converter configured to down-convert each of the intermediate signals to a plurality of component signals, the plurality of component signals including the input signal, each of the component signals having a high frequency equal to 1/N of the bandwidth plus a frequency margin, and each of the component signals having 1/N of the bandwidth.

23-25. (Cancelled)

26. (Original) A method of operating a communications system, comprising:

establishing a first portion of a frequency bandwidth to be received and processed by a satellite as a forward uplink, and a second portion of the frequency bandwidth to be received and processed by the satellite as a return uplink, the first and second portions comprising the total of the frequency bandwidth;

monitoring traffic volume on each of the forward and return uplinks;

determining a third portion of the frequency bandwidth to be received and processed by a satellite as a forward uplink, and a fourth portion of the frequency bandwidth to be received and processed by the satellite as a return uplink, the third and fourth portions comprising the total of the frequency bandwidth;

transmitting instructions to the satellite, the satellite including circuitry responsive to the transmitted instructions, such that the amount of frequency bandwidth allocated to the forward and return uplinks is allocated in proportion to the monitored traffic volume on each of the forward and return uplinks.

27. (Previously Presented) The method of claim 26, wherein monitoring traffic volume, determining the third and fourth portions, and transmitting instructions, are performed by a gateway.

28. (Currently amended) Apparatus, comprising:

means for receiving a filter parameter at a satellite in orbit;

means for receiving an input signal at the satellite;

means for programming a filter in the satellite to separate a plurality of sub-signals from the input signal based on the filter parameter;

means for receiving an original signal at the satellite, the original signal having a first center frequency and a first bandwidth; and

means for down-converting the original signal to the input signal, the input signal having a second center frequency equal to one-half of the <u>first</u> bandwidth plus a frequency margin, and the input signal having the first bandwidth.

29. (Original) The apparatus of claim 28, further comprising:

means for filtering the input signal into the plurality of sub-signals as programmed based on the filter parameter;

means for translating the plurality of sub-signals into an output signal; and means for transmitting the output signal from the satellite.

30. (Cancelled).

31. (Previously presented) The apparatus of claim 28, further comprising:

means for receiving a first signal at the satellite, the first signal having a bandwidth;

means for down-converting the first signal to a first intermediate frequency (IF);

means for filtering the down-converted first signal so as to produce a plurality of

N intermediate signals each of the intermediate signals having 1/N of the bandwidth; and

means for down-converting each of the intermediate signals to a plurality of component signals, the plurality of component signals including the input signal, each of the component signals having a high frequency equal to 1/N of the bandwidth plus a frequency margin, and each of the component signals having 1/N of the bandwidth.

32. (Previously presented) Apparatus for use in operating a communications system, comprising:

means for establishing a first portion of a frequency bandwidth to be received and processed by a satellite as a forward uplink, and a second portion of the frequency bandwidth to be received and processed by the satellite as a return uplink, the first and second portions comprising the total of the frequency bandwidth;

means for monitoring traffic volume on each of the forward and return uplinks;

means for determining a third portion of the frequency bandwidth to be received and processed by a satellite as a forward uplink, and a fourth portion of the frequency bandwidth to be received and processed by the satellite as a return uplink, the third and fourth portions comprising the total of the frequency bandwidth; and

means for transmitting instructions to the satellite, the satellite including circuitry responsive to the transmitted instructions, such that the amount of frequency bandwidth allocated to the forward and return uplinks is allocated in proportion to the monitored traffic volume on each of the forward and return uplinks.

33. (Previously presented) A non-transitory computer-readable medium including instructions stored thereon, the instructions facilitating operations comprising:

establishing a first portion of a frequency bandwidth to be received and processed by a satellite as a forward uplink, and a second portion of the frequency bandwidth to be received and processed by the satellite as a return uplink, the first and second portions comprising the total of the frequency bandwidth;

monitoring traffic volume on each of the forward and return uplinks;

determining a third portion of the frequency bandwidth to be received and processed by a satellite as a forward uplink, and a fourth portion of the frequency bandwidth to be received and processed by the satellite as a return uplink, the third and fourth portions comprising the total of the frequency bandwidth; and

transmitting instructions to the satellite, the satellite including circuitry responsive to the transmitted instructions, such that the amount of frequency bandwidth allocated to

the forward and return uplinks is allocated in proportion to the monitored traffic volume on each of the forward and return uplinks.